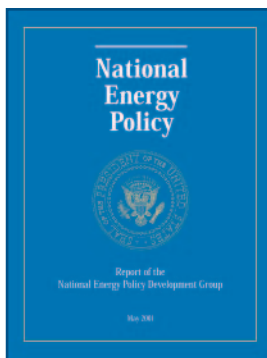
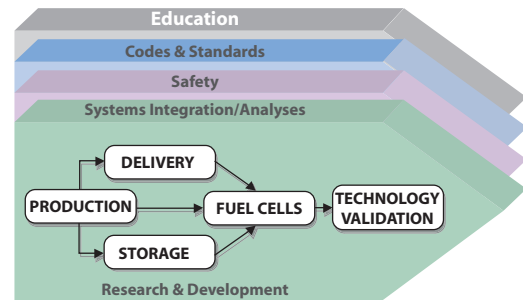


3.8 Education– Deferred

The Education Program element is deferred to FY 2006 subject to congressional appropriation.

The National Energy Policy and National Hydrogen Energy Roadmap, two guiding documents for DOE hydrogen activities, pay special attention to education.

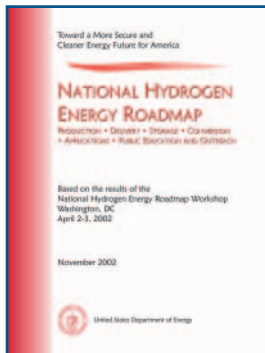
The National Energy Policy recommends that the Secretary of Energy develop an education campaign about hydrogen.



“The NEPD Group recommends that the President direct the Secretary of Energy to develop next-generation technology—including hydrogen.... Develop an education campaign that communicates the benefits of alternative forms of energy, including hydrogen...”

-National Energy Policy, May 2001¹

The National Hydrogen Energy Roadmap, which lays the foundation for a national move toward the use of hydrogen energy, also establishes a priority for education activities and suggests that education is an appropriate activity for the federal government.



“Educating consumers, industry leaders, and public policy makers about the benefits of hydrogen is critical to achieving the vision.”

-National Hydrogen Energy Roadmap, November 2002²

Following the National Energy Policy and Roadmap recommendations, the Hydrogen, Fuel Cells & Infrastructure Technologies Program established the Education Program element to accomplish the overall objective of educating target audiences about the long-term benefits and near-term realities of hydrogen, fuel cell systems, and related infrastructure. The Education Program element will help audiences to do the following:

- Understand the general concept and value of a hydrogen economy
- Recognize the near-term realities and opportunities of hydrogen and fuel cell technologies
- Develop an accurate understanding of hydrogen safety issues
- Understand, where appropriate, their part in facilitating the transition to a hydrogen economy

¹ National Energy Policy: Report of the National Energy Policy Development Group (May 2001) U.S. Government Printing Office ISBN 0-16-050814-2 <http://www.whitehouse.gov/energy/National-Energy-Policy.pdf>

² National Hydrogen Energy Roadmap (November 2002) U.S. Department of Energy http://www.eere.energy.gov/hydrogenandfuelcells/pdfs/national_h2_roadmap.pdf

Education crosscuts all of the Hydrogen, Fuel Cells & Infrastructure Technologies Program elements. The Production, Delivery, Storage, Fuel Cells, Codes and Standards, Safety and Technology Validation Program elements will provide formal and informal input to Education activities, particularly for materials development and technical information communicated through training. With regard to projects and tasks focused on the needs of specific target audiences, coordination with the Codes and Standards, Safety and Technology Validation Program elements is particularly important.

3.8.1 Goal and Objectives

Goal

Educate key audiences about the concept of a hydrogen economy and fuel cell and hydrogen systems to facilitate near-term demonstration and long-term commercialization and market acceptance of these technologies.

Objectives

By 2010 –

- Achieve a fourfold increase in the number of state and local government representatives who understand the concept of a hydrogen economy, and how it may affect them.*
- Achieve a fourfold increase in the number of students and teachers who understand the concept of a hydrogen economy, and how it may affect them.*
- Achieve a twofold increase in the number of large-scale end-users who understand the concept of a hydrogen economy, and how it may affect them.*
- Launch a comprehensive and coordinated public education campaign about the hydrogen economy and fuel cell technology.

3.8.2 Approach

Education Framework

Although this plan establishes a framework for the Education Program element and identifies activities for 2003–2011, it is not intended to limit or exclude the pursuit of any new or different opportunities that may arise over time. Projects outside the scope of this plan will be considered, as appropriate.

Coordination with Other Entities

Educational activities will be coordinated with other Program element activities – Technology Validation, Safety, and Codes and Standards, in particular – as well as other relevant activities conducted by DOE offices and programs, national laboratories, trade associations, industry and others. Careful consideration will also be given to coordination with the Energy Efficiency and Renewable Energy's (EERE's) Office of Communications and Outreach to ensure all Program materials are developed according to EERE design and format guidelines.

Also, to the extent possible, the development and implementation of education strategies will be coordinated with emerging local, state, and regional hydrogen, fuel cell and clean energy efforts. The Education Program element will work with DOE Regional Offices to facilitate networking among national, state and local educational entities.

*According to a 2004 baseline

Approach

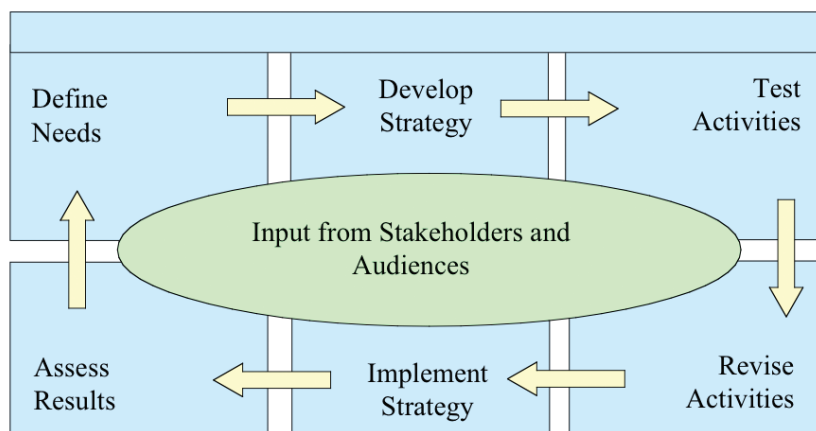
A comprehensive education campaign needs a foundation on which to build. This foundation consists of readily available “groundwork” materials that provide Program background and general information about hydrogen and fuel cells—as well as a means by which to distribute the information. Although a growing number of people now refer to the Web for their informational needs, printed documents, videos, and CDs remain in high demand. Education activities will rely on Web-based materials to the greatest extent possible, including creating a library of educational materials and building an effective distribution system to serve multiple target audiences. (Previously published materials will be reviewed and used as appropriate.) The information dissemination infrastructure will provide users and Program partners nationwide with quick and easy access to educational materials, and it will provide education activity managers with a mechanism for tracking use and collecting feedback that can improve the Program.

Once a Program foundation is established, attention can turn to activities that serve the specific needs of several key target audiences. Initial education efforts will focus on state and local governments, community groups and public citizens living in areas where near-term demonstration projects are planned, teachers and students, and (to a lesser extent) potential large-scale end-users—target audiences identified as critical to the successful implementation of near-term technology demonstrations and whose buy-in requires sustained education efforts. In addition, safety and code officials comprise another critical-need audience; appropriate education activities will be conducted in conjunction with the Safety and Codes and Standards Program elements. It is important to note that the timeline for implementing strategies to reach priority audiences will vary slightly, according to their education needs relative to the market-readiness of the technology.

Audience needs will be researched before new educational materials or programs are developed. Much of this research will be addressed by a national, scientific and statistically-valid baseline knowledge survey conducted in FY2004. The survey will be repeated in 2007 and 2010, and as funds allow, additional non-survey assessments of target audience needs will be conducted in interim years.

When possible and as often as practical, activities and materials will be tested and revised before being implemented or published to ensure their effectiveness. Once launched, they will be monitored and audiences will have an opportunity to provide feedback for consideration in future editions or revisions. This process will help to ensure that audience needs are served, education activities achieve success, and Program goals are met (see Figure 3.8.1).

Figure 3.8.1 Education Program Element Approach



Careful consideration will be given to the messaging. Clearly communicating the benefits of using hydrogen and fuel cell technologies is important, as is communicating the facts about hydrogen safety. The National Academies emphasized the importance of public education about hydrogen safety in its report, “The Hydrogen Economy: Opportunities, Costs, Barriers, and R&D Needs.”³ Specifically, the report recommends, “The DOE’s public education Program should continue to focus on hydrogen safety, particularly the safe use of hydrogen in distributed production and in consumer environments.”

The message must also communicate the technical challenges ahead; the critical research, development and demonstration activities needed to ensure successful commercialization; and the timeframe for the potential mass-market introduction of hydrogen and fuel cell technologies.

Program End-Point

Achieving the national vision for hydrogen and fuel cells will require a long-term RD&D strategy—and an even longer-term education strategy. DOE’s RD&D effort for hydrogen fuel cell vehicles, for example, is intended to allow an industry commercialization decision to be made in 2015 and a subsequent vehicle introduction to dealer showrooms by 2020. Education is critical to prepare for that market introduction and to enable demonstration projects that can inform research and development activities prior to the 2015 decision. Local community resistance to near-term hydrogen demonstration projects, often rooted in a misunderstanding of hydrogen safety, can jeopardize implementation. In some cases, it has been strong enough to halt demonstrations altogether. Similarly, safety and code officials can facilitate or inhibit near-term demonstration projects. Education and training programs will help to ensure that the necessary hydrogen-specific codes are adopted and that emergency responders are well prepared.

Education is also required after the planned 2020 commercial introduction to facilitate market success and penetration beyond the niche of early adopters. A full-scale, national education campaign to reach the general public, if timed properly, could help overcome knowledge barriers, including safety concerns and facilitate market success, while also reflecting the market readiness of the technology. As the technology moves toward mainstream market penetration, a government role in education becomes less critical and a phase-out or ramping-down of government-funded education activities may be appropriate.

3.8.3 Programmatic Status

Stakeholder Input

To begin a dialogue with specialists on the content of and issues related to an educational program about hydrogen and fuel cells, DOE convened a workshop in Washington, D.C. in December 2002. More than 50 individuals participated, representing industry, government, non-governmental organizations, national laboratories and universities. Specific objectives were to solicit input regarding the following:

- Goals and objectives for the Hydrogen, Fuel Cells & Infrastructure Technologies Program’s Education Program element
- Factors driving the need for educational activities
- Target audiences and relative priorities
- Activities to reach target audiences
- Educational projects and activities that DOE might support

³ The Hydrogen Economy: Opportunities, Costs, Barriers, and R&D Needs (February 2004) National Research Council and National Academy of Engineering of the National Academies. National Academy Press, Washington, C2004, <http://www.nap.edu/books/0309091632/html/>

The Education Workshop was conducted in an open and participatory manner. Attendees met in plenary and parallel breakout sessions to discuss the eight target audience groups identified in Table 3.8.1, and gathered in plenary sessions to discuss common themes and crosscutting activities, as well as overall Program priorities.

Table 3.8.1 Key Objectives by Target Audience

Target Audience	Key Objectives
State and Local Government Representatives (e.g., city, county, state, and regional governments, agencies, and associations)	<ul style="list-style-type: none"> • Provide objective, accurate information that government representatives can rely on as part of their research to make informed decisions.
Large-Scale End Users (e.g., transit agencies, fleets, building associations and subdivisions, hospitals)	<ul style="list-style-type: none"> • Provide objective, accurate information that potential end users can use as part of their research to make informed decisions. • Support training for potential end users.
Educators and Students (e.g., primary and secondary schools, colleges, universities, and other post-secondary institutions)	<ul style="list-style-type: none"> • Improve the level and breadth of hydrogen and fuel cell education, using established resources wherever possible and appropriate. • Increase the number of schools teaching hydrogen and fuel cell courses. • Support and promote internships, academic research, and hands-on product demonstrations in these areas.
Code Writing Organizations	<ul style="list-style-type: none"> • Provide objective scientific and technical information to facilitate and expedite the implementation of codes and standards.
National Regulatory Agencies	<ul style="list-style-type: none"> • Provide objective scientific and technical information to support the timely development of hydrogen and fuel cell policies and regulations.
Professional, Labor, and Trade Organizations	<ul style="list-style-type: none"> • Support training for potential end-users and the labor force for a hydrogen infrastructure.
Financial Institutions (lenders, investors, and insurers)	<ul style="list-style-type: none"> • Provide objective, accurate information that these groups can use as part of their research to make informed decisions.
General Public	<ul style="list-style-type: none"> • Provide timely, objective, consumer-oriented information to support the transition to a hydrogen economy.

Of the eight target audience groups, participants placed a high priority on those whose immediate buy-in is important to overcome barriers to early hydrogen and fuel cell efforts. Participants singled out state and local government representatives, safety and code officials, and large-scale end users, in particular. Also, considering the need to develop the next generation workforce and provide accurate and objective information, students, teachers and the public were added to the list of priority audiences. (Federal government representatives and legislators were also discussed as a priority audience; within DOE’s current organizational structure, however, activities to serve their needs largely fall under the purview of EERE and the EERE Office of Communications and Outreach).

Three cross-cutting areas also emerged as initial focal points of the Education Program element—information management, including dissemination of accurate, objective information; educational activities; and coalition and partnership building. Activities in these three cross-cutting areas, coupled with the target audience priorities, provide focus for Education Program element activities.

Planned Activities

In 2003 and 2004, the Program initiated several projects to build its new hydrogen education effort, as noted in Table 3.8.2 and illustrated in Figures 3.8.2 and 3.8.3.

Table 3.8.2 Current Hydrogen Technology Education Activities	
Education Groundwork	
Baseline knowledge assessment	Oak Ridge National Laboratory, Opinion Research Corporation
Educational materials for multiple target audiences	National Hydrogen Association; Energy and Environmental Analysis and partners; Anderson Creative Group and partners; Argonne National Laboratory; Computer Systems Management, Inc., Hydrogen 2000, and others
K-12 Teachers and Students	
Comprehensive high school hydrogen technology curricula and teacher professional development	Lawrence Hall of Science at the University of California at Berkeley and partners
Comprehensive middle school hydrogen technology curricula and teacher professional development	National Energy Education Development (NEED) Project and partners
Colleges and Universities	
Hydrogen Technology Learning Centers	National Association of State Energy Officials; Florida Solar Energy Center, Rochester Institute of Technology, University of California at Davis, San Diego Miramar College; Virginia Tech, University of Maryland at College Park, Breakthrough Technologies Institute, Hampton Roads Clean Cities Coalition; North Carolina A&T, University of South Carolina, University of Georgia, University of Florida
“H2U” University Design Competition	National Hydrogen Association, other industry partners
State and Local Governments	
Hydrogen Learning Workshop Series	DOE Regional Offices, other state and local partners



Figure 3.8.2. Hands-on activities, such as this model fuel cell car race, allow students to delve into hydrogen and fuel cell technologies.
(Photo courtesy of Blanche Sheinkopf)



Figure 3.8.3. “Hydrogen 101” workshops provide an opportunity for state and local government officials to learn more about the hydrogen economy and fuel cell technology.
(Photo courtesy of the Maryland Energy Administration)

3.8.4 Challenges

Energy Secretary Spencer Abraham, in his foreword to the National Hydrogen Energy Roadmap, writes: “To talk about the ‘hydrogen economy’ is to talk about a world that is fundamentally different than the one we know now.” He also refers to the change in how we produce, store and use energy as “revolutionary.”

That the hydrogen economy is a revolutionary change from the world we know today is the fundamental challenge to the education activity. Although great momentum and enthusiasm exist among the hydrogen and fuel cell industries (due in part to the announcement of the President’s Hydrogen Fuel Initiative in January 2003), the public remains largely unaware of hydrogen as an energy carrier. People are, by nature, hesitant—or resistant—to change, particularly when that change requires embracing a technology based on unfamiliar principles (such as the electrochemical oxidation of hydrogen). Anecdotes about the Hindenburg tragedy also perpetuate false perceptions about the safety of hydrogen use and compound that resistance to change—despite the potential benefits of a hydrogen economy. In a December 2000 transportation energy survey conducted by Opinion Research Corporation International on behalf of the DOE, 1,000 people were asked the following question: “Consider a day when gasoline is no longer available. Which of the following do you think would be the worst fuel for use in personal vehicles: ethanol, hydrogen, or electricity?” Of the respondents who chose hydrogen as the worst fuel, more than 50% cited safety concerns, attributed largely to what they had heard or their own intuition. Another almost 20% reported that they didn’t know why hydrogen would be the worst—but that they simply thought it would be.

Therefore, an emphasis on safe practices for handling and using hydrogen is critical to advancing the development of the technology. Community resistance to the installation of local hydrogen fueling stations, for example, can slow and even prohibit project implementation. Moreover, when captured by the media, such misunderstandings can spread to other communities unfamiliar with hydrogen, thereby perpetuating fears about the safe use of hydrogen and jeopardizing other demonstration projects. It is the duty of the Program to educate the public on the safe use of hydrogen.

Dangers exist for the handling of any fuel. For many decades motorists were not allowed to pump their own gasoline because of safety concerns. Yet after 100 years of relying on internal combustion engines, a high degree of comfort has been instilled for using gasoline. Such familiarity and the convenience of our current energy infrastructure contribute to complacency with the status quo, which adds to the challenge of educating for change.

3.8.4.1 Barriers

Resistance to change and concerns about hydrogen safety comprise the overarching challenge for the Education Program element. The following section outlines barriers to implementing the education activities intended to address the challenge and meet Program goals and objectives.

- A. Lack of Awareness.** Interest in hydrogen and fuel cell technology is increasing, but there remains a general lack of awareness of hydrogen as an energy alternative. Moreover, although world events have drawn new attention to national energy security issues, there is little consensus about the severity of today's environmental problems or linkages to fuel choice. With little awareness, understanding, or recognition of these issues, there is little impetus for change, and target audiences are less inclined to embrace new technology.
- B. Lack of Demonstrations or Examples of Real World Use.** Hands-on, personal experience greatly enhances understanding and comfort with using any new technology. With the current limited number of real-world examples, however, local communities, as well as safety and other local government officials, may be reluctant to embrace hydrogen technology. They may also resist near-term demonstration projects based on a lack of information, particularly if they have questions related to hydrogen safety.
- C. Institutional Barriers and Access to Audiences.** Once audience information needs have been defined and educational materials or training workshops have been developed, they must reach their intended audiences to be effective. Institutional barriers can complicate or inhibit access to target audiences. Moreover, identifying the right organizations, as well as a champion within each organization to embrace hydrogen and fuel cell technologies, can be challenging.
- D. Regional Differences.** Educational needs will vary by audience, but they may also vary regionally. What applies to one state, county, city or district, may not apply to another. Serving the education needs of a single target audience may therefore require multiple approaches tailored to serve the needs of various regions. This strains resources and can complicate activities developed at the national level.

3.8.5 Task Descriptions

Task descriptions are presented in Table 3.8.3.

Table 3.8.3. Task Descriptions

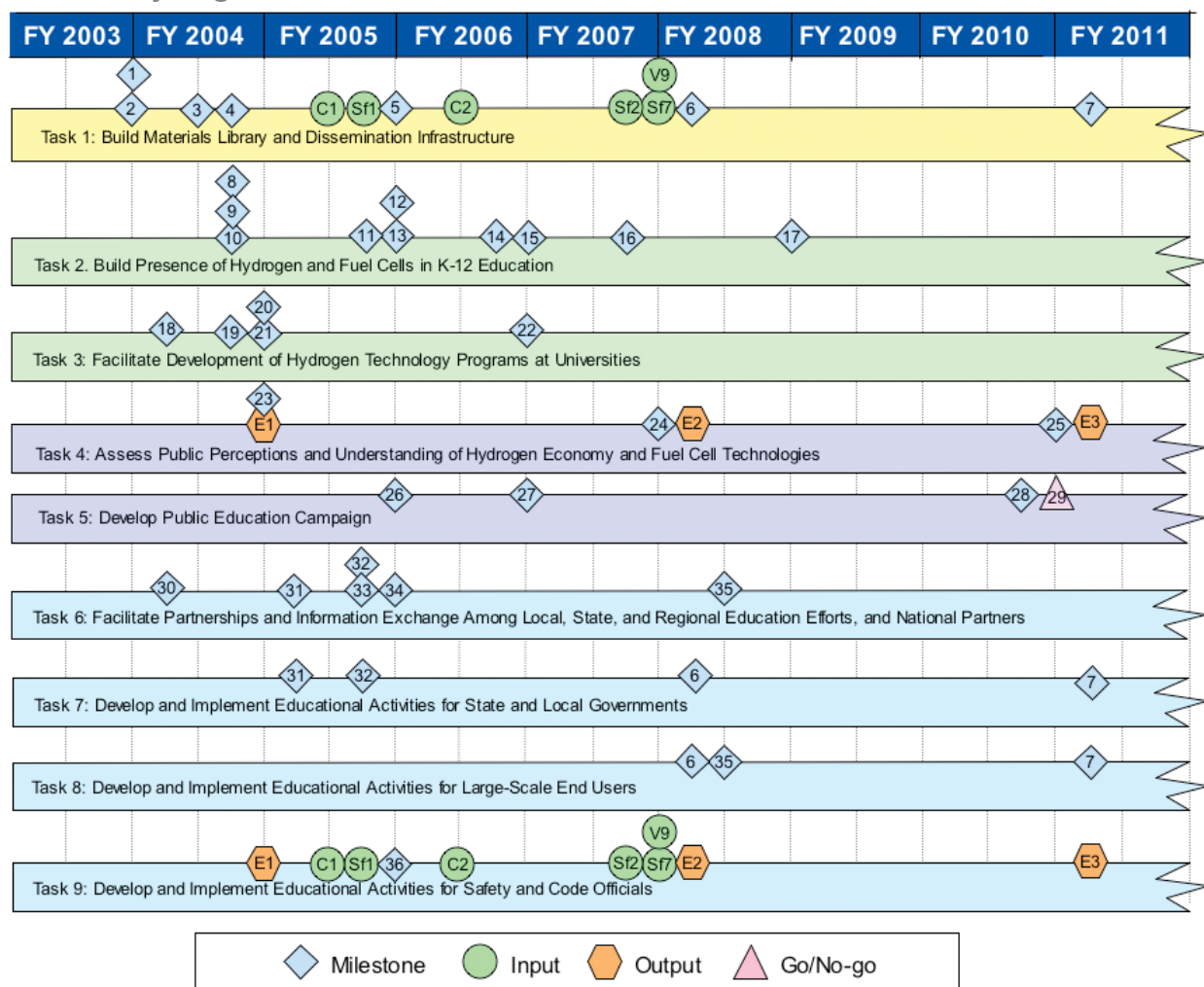
Task	Description	Barriers
1	Build Materials Library and Dissemination Infrastructure <ul style="list-style-type: none"> • Add new features to meet educational goals and address information gaps to the DOE Web site • Build visibility of education materials on the Web • Determine needs and structure for a clearinghouse; identify opportunities to tie into existing hotline/clearinghouse capabilities • Establish and promote availability of information clearinghouse • Create library of educational materials to serve the needs of multiple target audiences • Create specialized distribution plans for high visibility materials, identifying partners as necessary 	Barrier A
2	Build Presence of Hydrogen and Fuel Cells in K-12 Education <ul style="list-style-type: none"> • Identify and review currently available hydrogen technology teaching materials • Evaluate opportunities to integrate hydrogen and fuel cell information into traditional and/or existing materials <ul style="list-style-type: none"> ◦ Identify partners with hydrogen and education expertise and create hydrogen technology curricula and coordinated and sustainable teacher training/professional development program for middle schools and high schools ◦ Use secondary school experience to develop corresponding program for elementary schools 	Barriers A, C, D
3	Facilitate Development of Hydrogen Technology Programs at Universities <ul style="list-style-type: none"> • Build internet-enabled database of university-level programs for hydrogen and fuel cells • Evaluate – and pursue, as appropriate – opportunities, to expand hydrogen and fuel cell focus of current DOE-sponsored university programs • Evaluate – and pursue, as appropriate – opportunities to work with industry and trade associations to engage college and university students from a variety of disciplines in the development of a hydrogen economy • Work with university partners to develop and expand hydrogen technology curricula for undergraduate and graduate students • Facilitate the development of college and university networks to extend the availability and use of hydrogen technology curricula, as appropriate and practical 	Barriers A, B, C, D
4	Assess Perceptions and Understanding of Hydrogen Economy and Fuel Cell Technologies <ul style="list-style-type: none"> • In 2004, conduct a baseline knowledge assessment of key target audiences • Conduct periodic reassessments of public perceptions through 2010 	Barriers A, C, D

5	<p>Develop Public Education Campaign</p> <ul style="list-style-type: none"> • Use knowledge assessments to identify audience education needs • Work with local and state partners to distribute general education materials to address initial education needs • Work with Technology Validation partners to implement initial public education strategies in conjunction with near-term demonstration projects • Identify partners for national-level coordinated public education campaign • Develop comprehensive plan for education campaign—develop and test messages, identify cost-effective communication mechanisms and methods for evaluating success • Implement public education campaign with partners 	Barrier A
6	<p>Facilitate Partnerships and Information Exchange among Local, State, and Regional Education Efforts, and National Partners</p> <ul style="list-style-type: none"> • Work with DOE Regional Offices and established and emerging state and local partnerships and coalitions to facilitate information exchange and coordinate activities to maximize the reach of education efforts and avoid duplication • Create a Hydrogen Education Review Panel to facilitate coordination of education activities among partners with objectives that are national in scope 	Barrier A, B, C, D
7	<p>Develop and Implement Educational Activities for State and Local Governments</p> <ul style="list-style-type: none"> • Provide objective information about hydrogen technology, safety, challenges to commercialization, and the role that state and local governments can play in the transition to a hydrogen economy • With DOE Regional Offices and state and local partners, develop and conduct training workshops to educate state and local governments 	Barriers A, B, C
8	<p>Develop and Implement Educational Activities for Large-Scale End Users</p> <ul style="list-style-type: none"> • Provide objective information about the technology and hydrogen safety; share case studies, best practices, and lessons learned from the experiences of current users and, in particular, participants in Technology Validation projects • With industry and trade association partners, as well as the Safety and Technology Validation subprograms, educate potential large-scale end users and facilitate technician and employee training 	Barriers A, B, C
9	<p>Develop and Implement Educational Activities for Safety and Code Officials</p> <ul style="list-style-type: none"> • Create coordination plan with Safety, Codes and Standards Program elements to identify opportunities and education gaps • Develop and implement training activities, as appropriate 	Barriers A, B, C, D

3.8.6 Milestones

Key education achievements often involve the creation of a product. As such, Figure 3.8.4 shows the milestones and deliverables, as well as the interrelationship of these elements with the tasks and inputs from other subprograms for the Education Program element from FY 2004 through FY 2011. This information is also summarized in Table B.8 in Appendix B.

Figure 3.8.4. Hydrogen Education R&D Milestone Chart



The Education Program element is deferred to FY 2006 subject to congressional appropriation.

For chart details see next page.

Milestones

- 1 Complete Web site needs assessment.
- 2 Identify opportunities to tie into existing clearinghouse infrastructures.
- 3 Establish information clearinghouse.
- 4 Complete “phase 2” Web site upgrades and improvements (“phase 1” was initial launch, completed January 28, 2003).
- 5 Deliverable: Create library of materials, including, but not limited to the following: fuel cell technology fact sheets, hydrogen “basics” fact sheet (production, storage, delivery), hydrogen safety fact sheet, technology “challenges” fact sheet.
- 6 Deliverable: Publish data from first generation Technology Validation projects.
- 7 Deliverable: Publish data from second generation Technology Validation projects.
- 8 Identify and review existing teaching materials for grades K-12.
- 9 Identify and evaluate opportunities to work with traditional textbook companies to incorporate hydrogen and fuel cell information.
- 10 Publish middle school hydrogen activity guide to serve interim education needs.
- 11 Publish high school hydrogen activity guide to serve interim education needs.
- 12 Develop and pilot draft comprehensive middle school hydrogen technology curricula.
- 13 Develop draft comprehensive high school hydrogen technology curricula.
- 14 Publish elementary school activity guide.
- 15 Publish comprehensive middle school hydrogen technology curricula; launch dissemination strategy and teacher professional development.
- 16 Conduct local pilots and national field tests of comprehensive high school hydrogen technology curricula and teacher professional development training modules.
- 17 Launch national dissemination of comprehensive high school hydrogen technology curricula and teacher professional development program.
- 18 Launch hydrogen technology competition for university students.
- 19 Deliverable: Publish database of existing university programs.
- 20 Evaluate opportunities to expand hydrogen and fuel cell focus of current DOE-sponsored university programs.
- 21 Launch Hydrogen Technology Learning Center program for colleges and universities.
- 22 Complete development of community college hydrogen technology curriculum.
- 23 Establish baseline level of public awareness and perceptions.
- 24 Conduct follow-up public perception analysis.
- 25 Complete public perception assessment and results analysis.
- 26 Initiate national education campaign planning efforts with Controlled Hydrogen Fleet and Infrastructure Validation project partners.
- 27 Create plan for pilot public education campaign in conjunction with Controlled Hydrogen Fleet and Infrastructure Validation project partners.
- 28 Complete pilot of public education campaign strategies in conjunction with Controlled Hydrogen Fleet and Infrastructure Validation partners and in communities with ongoing technology validation activities.
- 29 Go-Now/Go-Later: Decision point on launch of full-scale public education campaign.
- 30 Complete assessment of opportunities for joint education activities with existing community partnership programs.
- 31 With DOE Regional Office and state and local government partners, complete first Hydrogen Learning Workshop Series to educate state and local government officials.
- 32 Building on first series, launch second series of Hydrogen Learning Workshops for state and local government officials.
- 33 Identify partners to serve on Hydrogen Education Review Panel.
- 34 Launch Hydrogen Education Review Panel.
- 35 Launch Hydrogen Learning Workshop series for potential large-scale end-users.
- 36 Establish a coordination plan with Safety and Codes and Standards program elements for state and local safety and code official training.

Outputs

- E1 Output to Safety: Publish initial perceptions report.
- E2 Output to Safety: Publish interim perceptions report.
- E3 Output to Safety: Publish perceptions report.

Inputs

- C1 Input from Codes and Standards: Training modules for current practices.
- Sf1 Input from Safety: Report of common accident scenarios.
- C2 Input from Codes and Standards: Training modules for amended practices for new technologies.
- Sf2 Input from Safety: Updated report of common accident scenarios.
- V9 Input from Technology Validation: Final report on safety and O&M of three refueling stations.
- Sf7 Input from Safety: Final, peer-reviewed Best Practices Handbook.

